PROMOTING CLIMATE-SMART MINING IN NIGERIA

A Policy Paper

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Executive Summary

In 2015, the Nigerian government announced its prioritization of the development of the minerals resources sector which suffered decades of neglect following the civil war and the failure of successive administrations. The drive to attract investment to the sector led to several legal, regulatory and administrative reforms. For instance, the Ministry of Mines and Steel Development's Roadmap for the Growth and Development of the Nigerian Mining Industry 2016 informs that government designated 7 strategic minerals including coal as priority minerals for driving investments to the sector. Coal as a mineral is a high carbon pollutant which comes with high environmental degradation. Already many coal and other mineral mining host communities around the country are facing severe environmental pollution, socioeconomic and health challenges as a result of the mining operations carried out in their communities.

The 2015 Paris Agreement and the United Nations Sustainable Development Goals set in 2015, which Nigeria assented to, is committed to end the use of fossil fuels particularly coal to fight climate change and to achieve sustainable development. Unfortunately, in Nigeria these aspirations cannot be attained with government's prioritization of coal as an energy source for power generation. Even more importantly, considering the fact that coal mining host communities' environments are continually being devastated. The severe negative effects and impacts of mining and climate change on these mining host communities will have catastrophic impacts if urgent measures are not taken to ensure that they and their future generations are protected. On the other hand, while uncalculated guesses might suggest that the measures necessary to counter the impacts of climate change tend to threaten the operations and profitability of mining companies, evidence actually suggests that mining companies profit more by taking measures to counter climate change impacts on their business and host communities.

Conversely, studies have indicated that the mining of certain minerals are very crucial for the development of renewable energy technologies needed to combat the impacts of climate change. The concept of climate smart mining holds the potential of achieving the balance of sustainable mining and the achievement of sustainable development especially for populations that host mining operations. For Nigeria, this presents an opportunity for a mining and climate change dialogue.

This paper provides specific contributions for improving environmental impact assessments for mining projects and improving the legal and regulatory frameworks that govern mining in Nigeria and importantly, building climate adaptation and resilient capabilities for both mining companies and mining host communities. It provides a reference point for actors and stakeholders in the mining sector, including mining host communities, environmentalists and human rights activists to commence a dialogue on mining and climate change in Nigeria. Our hope is that this paper will make a significant contribution towards building a more climate smart, and holistic sustainable mining sector in Nigeria.

Table of Contents

Acronyms

BIA	Biophysical Impact Assessment
CCVA	Climate Change Vulnerability Assessment
CDA	Community Development Agreement
CDP	Carbon Disclosure Project
CIA	Community Impact Assessment
CO_2	Carbon dioxide
CSM	Climate Smart Mining
EIA	Environmental Impact Assessment
ELAW	Environmental Law Alliance Worldwide
EPRP	Environmental Protection and Rehabilitation Program
FMEnv	Federal Ministry of Environment
FMMSD	Federal Ministry of Mines and Steel Development
GHG	Green-house Gases
ICMM	International Council on Mining and Metals
MECD	Mines Environmental Compliance Department
MinDiver	Minerals Resources Project and Mineral Sector Support for Economic Diversification Project
NASPA-CCN	National Climate Change Adaptation Strategy and Action Plan for Climate Change
NCCPRS	National Climate Change Policy and Response Strategy
NDCs	Nationally Determined Contributions
NEEDS	National Environmental, Economic and Development Study
NESREA	National Environmental Standards and Regulations Enforcement Agency
SIA	Social Impact Assessment
UNFCCC	United Nations Framework Convention on Climate Change

Chapter 1: Nigeria's Mining Sector and Climate Change

1.0 Mining in Nigeria - Growth, Decline and Revival

Organized commercial mining[1] in Nigeria has spanned over 12 decades. The mineral surveys of the Southern and Northern Protectorates conducted by the Secretary of State for colonies between 1904 and 1909 marked the commencement of mining in Nigeria with the Royal Niger Company mining tin ore in Jos Plateau in 1905. The discovery of coal in Enugu in 1909, and later the rail connection with Jos, Enugu and Port-Harcourt in 1927 helped boost mining and rail communication in Nigeria tremendously. The coal from Enugu helped provide the much needed power for the tin ore mines to increase their production while the rail lines made it easier and cheaper to export both coal and tin ore out of Nigeria. By the late 1940s, major mining of monazite, limestone, lead-zinc ores, iron ores, gold, granite, coal, tin and columbite were in operation, with Nigeria becoming a major exporter of coal, tin and columbite.

The progress and growth that was being achieve was soon tapered by the discovery of crude oil in 1956, as government neglected the mining sector in favour of its new found quicker source of revenue. Also the Nigerian civil war which started in 1967, led to the shutdown of many mines and the evacuation of foreign mining experts from the southern parts of the country. The oil boom of the 1970s and government's drive to indigenize mining companies adversely affected efforts to resuscitate the mining industry. However, the economic downturn of the 1980s that followed fluctuating crude oil prices necessitated the government’s renewed interest in reviving the solid minerals sector through a private-sector led economic programme. This led to the creation of the Ministry of Solid Minerals Development in 1995, the formulation of a new National Policy on Solid Minerals Development in 1998, and the enactment of the Minerals and Mining Act, 1999.

The return of Nigeria to democratic rule at the turn of the new millennium, came with different regulatory and institutional initiatives to transform the mining landscape in Nigeria. Reforms included the establishment of: The Nigerian Geological Survey Agency; the Nigeria Institute of Mining and Geosciences; the Mining Cadastre Office; the Mines Environment Compliance Department; the Artisanal and Small Scale Mining Department, and the enactment of the: Nigerian Minerals and Mining Act, 2007; National Minerals and Metals Policy 2008; and Nigerian Minerals and Mining Regulations 2011. Beyond that, the government has sought to expand and strengthen the industry and ensure its continued growth through the launch of several initiatives. For instance, through the assistance of the World Bank, two key sector transformative projects were launched - The Sustainable Management of Minerals Resources Project, and the Mineral Sector Support for Economic Diversification Project (MinDiver).

[1] Community Mining has been ongoing in Nigeria since the 9th century AD which are indicative from Igbo Bronze archeological remains - https://en.wikipedia.org/wiki/Archaeology_of_Igbo-Ukwu

1.1 Changing Mining Landscape

As an energy intensive sector, mining has long been a major contributor to green-house gas emissions[2] and it was not until recently that the mining industry started to feel the impacts of climate change on its operations. In 2009, 76% of 41 global mining companies that made disclosures to the Carbon Disclosure Project (CDP) reported that climate change represented physical risks to their operations[3]. Amongst themes of challenges that were disclosed, challenges to environmental management and mitigation and increasing pressure points with community relations were also disclosed by the mining companies. According to the disclosure, the pressure points increase as mining host communities suffer from environmental stressors such as drought, flood, rising temperature and natural disasters which result in the loss of livelihoods and property; and increased vulnerability to famine and diseases. It also revealed that companies may face direct risks to operate over competition for resources such as water and energy.

Meanwhile, in 2016, the Federal Ministry of Mines and Steel Development (FMMSD) launched a roadmap for the sustainable development of the mining and metals sector in Nigeria. Amongst the roadmap's objectives is an industrial minerals strategy that prioritizes 7 minerals: coal, lead/zinc, iron ore, bitumen, barites, gold and limestone for development. These minerals are vastly untapped and also have the potential to contribute to Nigeria's economic development. While mining is generally a 'dirty business', for environmentalists and climate advocates, its deeply concerning that coal - a highly environmentally polluting hydrocarbon and green-house gases (GHG) emitter that is reputed to have contributed to generations of industrial revolution CO_2 emissions[4] was also listed as a priority mineral especially after Nigeria signed to commit to the 2015 Paris Climate Agreement and made commitments to cut her carbon emissions[5]. Analysis[6] show that if Nigeria develops its coal potential especially for the generation of electricity based on its National Energy Masterplan, Nigeria will by no means meet its United Nations Framework Convention on Climate Change (UNFCCC) Nationally Determined Contributions (NDCs) based on either the of the based on either the 20% unconditional and 45% unconditional mitigation objectives.

Asides the fact that coal is a high polluter, its mining in Nigeria including the mining of lead and other minerals have already led to significant environmentally pollution, social injustice, abuse of rights, health challenges and sometimes, related deaths in mining host communities.

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[2] According to estimates, in 2010 the mining industry global GHG emissions is 1Gt carbon dioxide equivalent (CO2e) - approximately 2% of global total emissions (the scope of the study comprised of mining, smelting and refining excluding the emissions from burning of coal - http://www.icmm.com/website/publications/pdfs/climate-change/measurement-reporting-verification

[3] The challenges disclosed by mining companies were categorized into different themes by which the mining sector is impacted climate change - https://www.bsr.org/reports/BSR_Climate_Adaptation_Issue_Brief_Mining.pdf

[4] Coal has contributed 46% of carbon dioxide emissions worldwide and accounts for 72% of total greenhouse gas (GHG) emissions from the electricity sector - https://endcoal.org/climate-change/

[5] Nigeria's National Determined Contributions (NDCs) committed to reduce Nigeria's historical (1850-2010) green-house gas (GHG) of 2,564.02 million tonnes unconditionally by 20% and conditionally by 45% based on Nigeria's 2010-2014 emissions baselines.

[6] Analysis on coal by Akachukwu Okafor published on https://drive.google.com/file/d/1e-MOHVVc5hcVeucwB2mF8v8uCpa5KgIK/view?usp=sharing

Unfortunately, this has been the tragic historical experience of Nigeria's extractive industry - starting from the Iva valley massacre and the pollution of water bodies on the Plateau in the late 1940s, to Niger Delta environmental pollution and agitations since the 1990s, to lead poisoning in Zamfara and Niger states in the 2000s.

Currently, the growing insecurity across Nigeria, are in some instances associated with mining activities, particularly in the North West, North Central states – Zamfara, Kaduna, and Niger States. The combination of poor human development indicators, disappearing livelihoods, and the festering toxic relationships between some mining companies, artisanal miners, the government and these mining host communities are building up considerable hostility, and are significantly changing Nigeria's mining landscape. Contextualizing this deeper is the intersection of the effects and impacts of mining activities with adverse climate change impacts. This is a concerning complex situation because most of the mining host communities are agrarian communities whose lives and livelihoods depend on the lands and water bodies that are being polluted by mining activities. Not only do these situations drive conflicts, they also increase food insecurity in the communities and the country, and also worsen the climate vulnerabilities of mining host communities which limit their opportunities for achieving sustainable development.

For example, in Maiganga in Gombe state, the Ashaka Cement's host communities have had to contend with their loss of water bodies due to the pollution of the main river by the company's activities. Alongside the pollution of their water bodies, their soil has also registered pollutants that have led to considerable loss of viability for agrarian activities. Okobo and Awo communities in Kogi state, have suffered similar fates[7]. In spite of these early warning signs, stakeholders in the Nigerian environmental, climate change and mining sectors, have not made significant progress towards reaching an agreement on how to counter these irreversible trends.

Elsewhere, on March 29, 2017, the mining world received the news of El Salvador's Legislative Assembly's unanimous passing of a law banning metal mining in El Salvador. The New York Times reported the news as "*El Salvador, Prizing Water over Gold, Bans All Metal Mining*[8]". A Salvadoran legislator pointed out that a decade ago, the impact of climate change on EL Salvador would have been difficult to tell but that things had now changed. Decades earlier, critics of the mining sector in El Salvador had been drawing attention to the growing vulnerability of El Salvador's water resources under climate change conditions and argued that the vulnerability will be exacerbated if mining in the country is allowed to continue. The mining sectors in Chile, South Africa, Russia, Zambia, and Australia have been alerted to pay increased attention to the growing climate change risks posed by their activities. As a water stressed country[9] with considerable vulnerability

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[7] Power at What Cost? A Report on the Impact of Coal Mining and Coal Power Generation in Okobo and Itobe Communities in Kogi State:
https://www.globalrights.org/Library/Biz%20&%20HR/Power_at_What_Cost_PDF_lowres.pdf

[8] *El Salvador, Prizing Water over Gold, Bans All Metal Mining:*
https://www.nytimes.com/2017/03/29/world/americas/el-salvador-prizing-water-over-gold-bans-all-metal-mining.html

[9] Marcus DuBois King February 15, 2019 *Water Stress: A Triple Threat in Nigeria* Pacific Council on International Policy Accessed on July 21, 2021 at https://www.pacificcouncil.org/newsroom/water-stress-triple-threat-nigeria

to climate change, Nigeria cannot continue to adopt a laissez- faire attitude to this precarious state of affairs.

Chapter 2: Conceptualizing Climate Change in the Mining Sector

2.0 Aligning Climate Change and Mining

Long before the El Salvadoran Legislative Assembly's ban on mining, there have been demands by policy think thanks, key actors, and stakeholders in the mining sector for the development of policies and frameworks that can help to address the risks that climate change impacts pose to the mining sector, the environment, and mining host communities. Their intent was to help build a level of climate resilience that is needed for both the mining sector and their host communities to lead the pathway for environmentally safe, inclusive, and sustainable development.

For instance, in 2013, the International Council on Mining and Metals (ICMM) published a report on adapting to climate change by the mining and metals industry in which it acknowledged the increasing climate change risks on the mining industry, growing vulnerability of local communities to climate change impacts and stressors exacerbated by mining operations. It went further to provide frameworks for addressing these challenges. The report further outlined four commitments for all its members to subscribe to in order to address GHG emissions. The commitments are: i) introduce emissions reductions strategies; ii) ensure the efficient use of natural resources; iii) support R&D of appropriate low carbon technologies; and, iv) measure and report on progress. These efforts including the recommendations of a report[10] advocated for i) improving social and environmental standards in the extractive sector; ii) support for national and regional dialogues on responsible mining which have been argued as practical ways for addressing the challenges posed by climate change on the mining industry.

While it is very evident that the mining industry contributes to GHG emissions, exacerbates climate change impacts on the environment, natural resources and local communities, studies also show that the mining industry is central to the development and growth of clean energy technologies that are key for GHG emissions reductions required to keep average global temperature below 2^0C. According to a 2017 World Bank report, the production of graphite, lithium and cobalt alone will have increase by nearly 500% by 2050 and over 3 billion tons of minerals and metals including graphite, lithium, cobalt, Indium, Vanadium, Nickel, Silver, Neodymium, Lead, Molybdenum, Aluminum, Zinc and Copper will be needed to deploy wind, solar, geothermal power and energy storage needed to achieve clean energy transition. This has reinforced the need for the mining industry to develop more climate resilient, environmentally responsible and friendly - Climate-Smart Mining[11] (CSM) approaches to its operations - without which negative impacts from mining activities especially on already vulnerable local communities and environment will increase.

[10] The report is the work of the Climate Diplomacy initiative which is a collaborative effort of the Federal Foreign Office of Germany in partnership with adelphi, a leading think thank and public policy consultancy on climate, environment and development - https://www.climate-diplomacy.org/file/2366/download?token=pNCxjxXU

[11] Climate Smart Mining is a new approach developed by the World Bank - https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action

This is the dichotomy that the mining sector is currently challenged with – it must evolve to fit in with the changing world that will require increased mining of certain minerals, and yet at the same time, it must evolve to fit in with a changing world that will require becoming climate smart in its exploitation of minerals in order not to further exacerbate climate change vulnerabilities. Exploring the concept of climate smart mining in Nigeria, first requires an understanding and analysis of the legal and regulatory frameworks governing mining in Nigeria and its impact on the environment. This will help reveal the extent of work that may be required for a climate compliant mining sector.

2.1 Challenges with the Legal and Regulatory Framework for Mining in Nigeria

A holistic review of Nigeria's current laws, policies and regulations on minerals, mining and the environment reveals that they are not robust enough to respond to the growing environmental and climatic changes, and anthropogenic pressures on the environment occasioned by mining; and impliedly, they are not sufficiently future-thinking. The failure to develop a progressive framework in this regard has largely been due to a lack of growth and development in the sector over the years. Additionally, the capacity and the political will of the government to enforce regulations and laws has also been questioned time and again. For instance, experts such as Gbite Adeniji had criticized the Minerals and Mining Act of 1999 for not incorporating the provisions of the Environmental Impact Assessment (EIA) Act which are central to the protection of the ecosystem. As an improvement, the revised Minerals and Mining Act 2007 provided for Environmental Impact Assessments to be conducted based on the Environmental Impact Assessment (EIA) Act CAP E12, LFN 2004 and associated guidelines as approved by the Federal Ministry of Environment (FMEnv).

One of the challenges is that while the National Minerals and Metals Policy 2008 and Minerals and Mining Act 2007 provides for every holder of an exploration license, small-scale mining lease, mining lease, quarry lease and water use to submit an EIA statement approved by the Federal Ministry of Environment and an Environmental Protection and Rehabilitation Program (EPRP) to the Mines Environmental Compliance Department (MECD) before the commencement of mining operations, the MECD does not have powers to reject a 'satisfactory' EIA statement issued by the Federal Ministry of Environment even when it determines that such an EIA was not carried out based on the EIA Sectoral Guidelines for Mining of Solid Minerals, Beneficiation and Metallurgical Processes or other environmental regulations by NESREA that pertains to mining. This will apply even in a situation in which the MECD has determined that while the EIA has met all the guidelines and regulations, however, that the EIA is inadequate to assess and mitigate the peculiar environmental and climatic conditions that the mining activity might occasion.

Asides the challenge of not adequately fulfilling the requirement of an EIA that is satisfactory and adequate for environmentally sound mining, it creates conflicts of interest, and unhealthy rivalry between government agencies and departments especially as the Ministry of Mines and Steel Development and Ministry of Environment and NESREA have concurrent powers to provide guidelines and regulations that may not be aligned.

In addition, experts such as Usman N.L have argued about the inappropriateness of the powers of the Minister of Mines and Steel Development to issue a mining lease even before a satisfactory EIA statement is obtained from the Federal Ministry of Environment. This practice has resulted in some mining companies commencing full scale mining operations without valid EIAs. Usman had argued that the Mining decree as it was then, needed to be reviewed to make a satisfactory EIA report a fundamental requirement for the granting of a prospecting license or mining lease. 20 years after his postulation, this is yet to happen.

Another challenge is that the environmental regulations have no clear definitions or interpretation of some critical terms it used in its provisions, and fails to classify certain terms. For instance, Part 1, Section 2(1) of the National Environmental (Mining and Processing of Coal, Ores and Industrial Minerals) Regulations 2009 states that "New development in the Mining and Processing techniques shall apply *up-to-date*, *efficient cleaner* production technologies to minimize pollution to the highest degree practicable". Section 3(1) of same Part 1 further states that "Every facility shall adopt *cleaner production processes* and *pollution prevention measures* that would yield both economic and environmental benefits". However, these provisions have no clear definitions and classification or categorization of what "up-to-date", "efficient cleaner production technologies", and "cleaner production processes and pollution prevention measures" are that are necessary to minimize environmental degradation and pollution in the sector.

These gaps have created an opportunity for Nigeria to become a mining pollution haven especially with the challenges that government agencies and departments including NESREA and the Mines Environmental Compliance Department are faced with in fulfilling their mandates. This concern about increased environmental degradation and health impacts of mining was expressed in the National Policy on Environment (Revised 2016), in which the Policy feared that the challenges may further complicate the "extremely friendly tax and regulatory regimes" that government may extend to mining companies in their bid to increase investments in the sector. As a result, the Policy proposed an appropriate review and enforcement of the Minerals and Mining Act 2007 amongst other recommendations. The impacts of these gaps are already been felt.

2.2 Impact of Weak Frameworks on the Environment and Local Communities

According to Guidebook for Evaluating Mining Project EIAs produced by the Environmental Law Alliance Worldwide (ELAW), an environmental impact assessment is a process that helps identify, predicts, and analyzes possible physical environmental effects/impacts as well as social, cultural and health impacts of a proposed activities and how the impacts can be mitigated. It further states that an EIA process is designed to help inform decision-makers and the public particularly potentially affected communities and individuals of the environmental consequences of implementing a proposed project.

The guidelines make some interesting provisions for conducting and reviewing EIAs. For conducting holistic EIAs, the guidelines highlighted the importance of community impact assessments (CIA), and also, determining the community's development trends - community life

plans or development plans. These are very critical issues that ensures that how a host community will be impacted by a project is rigorously assessed and the future development plans of a host mining community is critically considered when planning a project. For reviewing EIAs, some questions stand out: 1. Does the EIA focus on the issues that concern the host community most? 2. Does the description of the existing environment reflect actual conditions? Is the information sufficient? 3. Is the impact analysis clear about the extent and significance of the impacts? Is the analysis rigorous enough? These are questions that the EIA reviewers must interrogate before issuing a satisfactory EIA statement. It is very evident that the guidelines are is human/people and community centered.

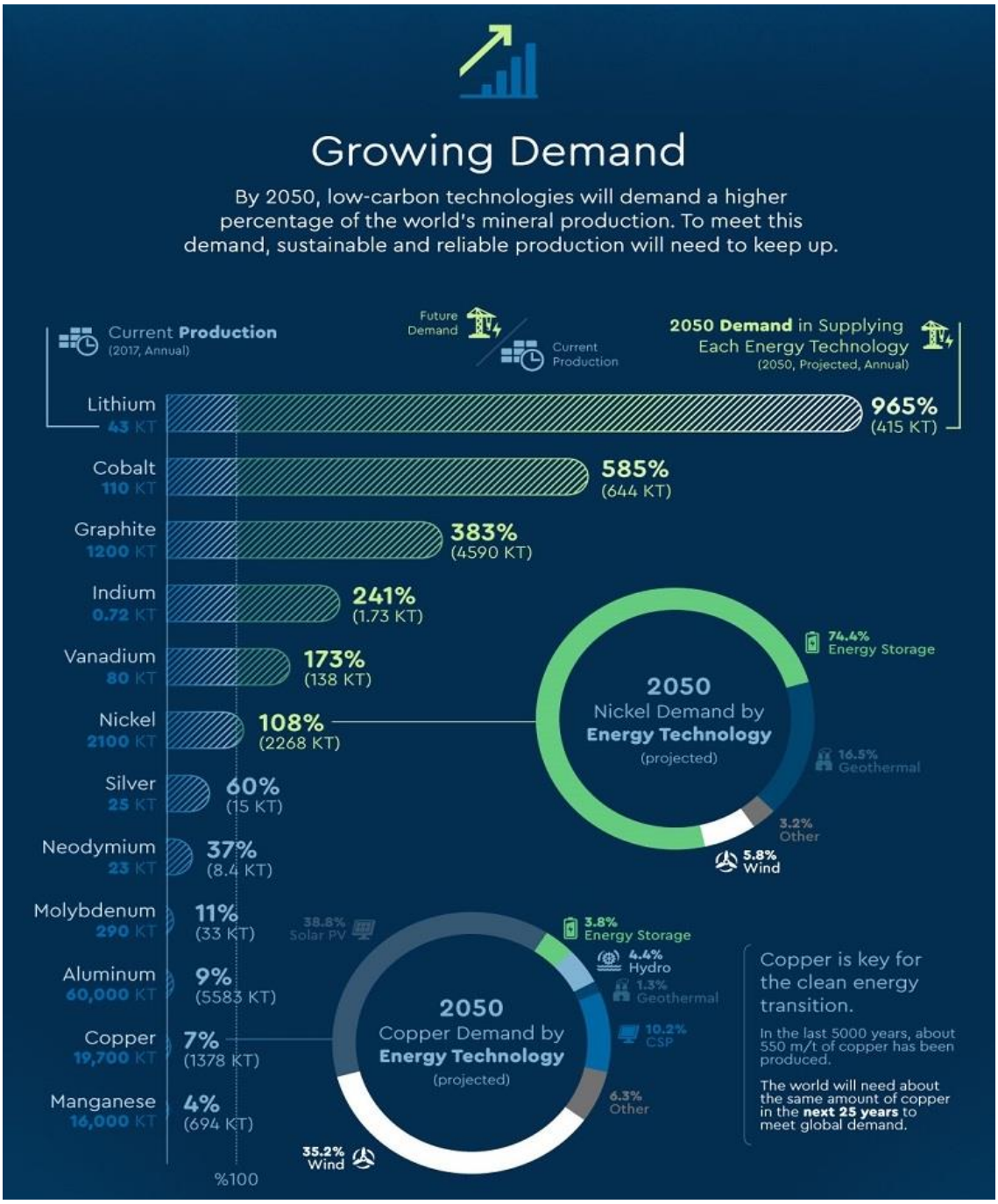
Unlike the ELAW's EAI guidelines, an analysis of the Ministry of Environment's EIA guidelines including its social impact assessment (SIA), and biophysical impact assessment (BIA) affirms that the guidelines are not human/people centered. Furthermore, it reveals the fact that the impact of development projects on humans, and in particular, on the local mining host communities is of little or no importance, value or relevance to the stipulated EIA process and its eventual outcome. The purview of the impacts of projects is dominantly framed to create an illusion that only the physical environment, and possibly animals/wildlife, will be impacted by the project being planned. To a great extent, it ignores the lives of the people/communities that depend on the environment and ecosystem for their sustenance and that are affected by impacts of projects from the entire picture. This is exemplified in the list of stakeholders for the "Public Involvement/Stakeholder Engagement Process" of the Social Impact Assessment Guideline and Standard, in which out of the mandated 10 stakeholders listed, "Members of the Public" was listed last without specific mention of project host communities that will be directly impacted by the project.

Environmental impact assessment guidelines and standards that are weak in assessing for, and mitigating the impacts on mining host communities may lead mining companies to believe that the government is not sufficiently interested in protecting the host communities from harmful environmental, socioeconomic, cultural and health impacts of mining operations. Unfortunately, this seems to be the case from the number of atrocious reports[12] of environmental pollution and various human rights violations across mining host communities in Nigeria. These atrocities have become the norm rather than the exception, and unfortunately, the relevant environmental and mining agencies and departments have been unable to address these challenges.

From the assessment above, it is evident that the provisions of the EIA Act, guidelines set by the Federal Ministry of Environment and enforced by the environmental regulations of the National Environmental Standards and Regulations Enforcement Agency (NESREA), are still inadequate to respond to the environmental and climatic vulnerabilities that are induced or exacerbated by mining activities which an EIA is meant to assess and mitigate.

[12] Global Rights Nigeria has published reports on the impact of mining especially coal in Kogi and Gombe states and impact of other mining activities across the country including Ebonyi, Zamfara, Oyo, Plateau, Niger and Osun states - https://drive.google.com/file/d/1m2leuTMITeULDVhh55WrCwevBhRtkD22/view?usp=sharing.

Equally worrying is the fact that there are no EIA requirement for artisanal mining in Nigeria. Given the reality that about 80 percent of mining activities in Nigeria is artisanal, and that artisanal mining tends to be even more environmentally devastating, and increase the climate vulnerability of the communities in which they operate.



Chapter 3: Coal Mining, Combustion and the Climate Change Nexus

Nigeria has an abundant supply of energy resources as it is endowed with thermal, hydro, solar, and gas resources and yet still, it is an energy-poor country. The nation needs about 200,000MW to meet its current energy needs. Currently it generates about 4500MW. Even at that, it loses about 50% of what it produces to an inefficient transmission grid and a moribund distribution system. Only about 50% of its population has access to the national grid in the first instance. According to the World Bank, Nigeria loses about $100 Billion annually due to its inability to supply sufficient electricity. Premised on development issues such as is illustrated by Nigeria's case, there has been a growing school of thought positing the need to recognize the right to energy as a human right.

There are many issues at play in Nigeria's energy dynamics: The supply of energy entails the generation, transmission, and distribution of energy- notably electricity, all of which in Nigeria are laden with their peculiar challenges.

According to its Ministry of Power, Works and Housing, the government is determined to diversify the country's energy mix by increasing power generated from other sources to reduce dependence on gas and hydro powered plants. It has proposed to include renewable energy sources in this mix. It has also proposed to generate 30% of the nation's energy needs from coal energy. Coal is therefore not only touted as a strategic mineral by the Ministry of Mines and Solid Minerals Development, but actively supported by the Ministry of Power, Works and Housing.

Nigeria's coal powered energy policy thrust on the surface appears reasonable. Its proponents often tout it as being 'available', 'cheap', and as creating job opportunities. But in reality, coal is possibly one of the most expensive energy sources on the planet when externalized costs (high carbons emissions largely responsible for the current surge in global warming; extensive consumption of limited water resources, environmental degradation, host community health, and air pollution) are factored in. Nigeria's 30% coal powered energy quest is also inconsistent with its COPP 22 INDC commitment and the President's pledge to make the country a reference point in emissions reduction.

Coal energy is not the only source of energy the Nigerian government is contemplating. It has rolled out a renewable energy plan of generating 20% of Nigeria's energy needs within its energy master plan in addition to the proposed 30% coal energy to supplement current hydro and gas energy sources.

Coal energy was a gamechanger throughout the industrial age, and even till now, it continues to be relied up by several countries as their main source of energy. For most of the world super power countries, coal provided them with the leverage for economic advancement. However, globally, it would seem that the reign of coal energy is on an ebb as its culpability in being a major greenhouse gas emitter, leading to the acceleration of the depletion of the ozone layer, and its impact on water bodies across the world, has led in a global push to end its regime, and a pull towards 'greener' energy sources, especially renewable sources. With clearly articulated plans, most countries that had hitherto relied on coal energy (even China) have started to diversify their

energy sources with the goal of staggered transitions to low-carbon/non-fossil energy sources overtime. Coal mining host communities across the world bear the legacy of its devastating impacts and are paying the hidden cost of its production. Nigeria is no different. The story of its colonial era stint into coal energy is often told without reference to the negative environmental impacts it had already started to have on its host communities[13].

Coal mining in Nigeria has continued to lead to negative environmental, social and health consequences in mining host communities[14]. This has largely been due to the failure of mining companies to adhere to best practices for safeguarding the environment; additionally, as earlier pointed out - the lack of an adequate regulatory framework for ensuring the protection of the environment and human populations over mining activities; and mining host communities' ignorance of the legal and regulatory frameworks governing mining and how to enforce their rights. This is the first tragedy associated with coal mining in Nigeria if coal was just mined, and not burned in Nigeria for energy generation purposes.

The second tragedy is that regardless of where the coal is burned, it contributes to carbon emissions that cause climate change, which Nigeria is extremely vulnerable to. According to Nigeria's official 2021 Nationally Determined Contribution (NCD) update to the United Nations Framework Convention on Climate Change (UNFCCC), Nigeria is one of the ten most climate vulnerable countries in the world. Further spatial vulnerability assessment[15] of Nigeria based on adaptive capacity, sensitivity and exposure to climate change indicates that the North East ranks highest, followed by the North West and North Central. The South West is the least vulnerable region followed by the South East and the South South being the least vulnerable. Incidentally, 73% of the 26 coal mining licenses[16] issued by the Ministry of Mines and Steel Development are operated in the North East (Gombe State) and North Central (Kogi and Benue States), regions that rank the highest and third highest on climate vulnerability.

What this entails is that these regions will continue to suffer environmental pollution, degradation and health risks of coal mining operations and at the same time, succumb faster to the vulnerabilities of climate change. Interestingly, these states are also the nation's top agricultural production states, and include Cross River, Delta and Enugu states where coal is mined, alongside other agricultural states where mineral mining is causing environmental pollution of the environment, especially of water bodies and the soil.

Nigeria's climate reality is that the mining of coal and its consumption - both domestically in industries and for export, is harmful to Nigeria, and that its negative impacts may worsen in the future if nothing is done to immediately halt its growth trajectory. It is estimated that climate

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[13] Contaminated blessing! How coal mining polluted water sources, vegetation, soil in Enugu The Nation Newspaper December 27, 2020 e

[14] Global Rights report on coal mining host communities across: https://drive.google.com/file/d/1m2leuTMITeULDVhh55WrCwevBhRtkD22/view?usp=sharing.

[15] Nigeria's Second National Communication Under the United Nations Framework Convention on Climate Change (2014): https://unfccc.int/resource/docs/natc/nganc2.pdf

[16] Ministry of Mines and Steel Development Portal: https://portal.minesandsteel.gov.ng/MarketPlace/Mineral/Occurrence/40

change impact in Nigeria without adaptation measures could cost between 6% and 30% of Nigeria's Gross Domestic Product (GDP) by 2050, which amounts in monetary terms to between USD 100 billion and USD 460 billion. For instance, the 2012 floods cost Nigeria about NGN2.6 trillion/USD 17.3 billion[17].

The government's recent policy objectives of designating coal as a strategic mineral, and as an energy resource that is projected to contribute 30% to the national energy mix[18] is not only alarming but contradicts Nigeria's GHG emissions reduction commitments in the Nationally Determined Contributions (NDC). While the first NDC and recently revised 2021 version submitted to the UNFCCC which scored fugitive emissions from solid fuels (the category that coal belongs to) as 0% based on 2018 data, and is silent on the mitigation priorities. However, the reality is that coal mining and consumption in industries as a source of energy is increasing as the Ministry of Mines and Steel Development's licenses show. Interestingly, Nigeria's National Policy on Climate Change (NPCC), 2013's Nigeria Climate Change Policy Response and Strategy (NCCPRS) has a programme for the "environmental-friendly development of coal mines and coal fired power stations" that scheduled an activity to "review coal mining methods and undertake a feasibility study to assess the technical, economic, social and environmental feasibility of coal mining for power generation (including factors such as how to capture coal bed methane) to increase power supply and improve energy access".

The NCCPRS further states that on the condition that the feasibility study is positive, Nigeria will "invest in coal mining and coal-fired power generation plants using clean coal technology". Today, there is neither anypublic record that the feasibility study has been carried out nor of results published. The fact is that the science and technology of "clean" coal mining or "clean" coal power generation is still aspirational and a long way off from reality. At best they are in various stages of demonstrations around the world, and at very prohibitive costs which Nigeria cannot afford, even less so, private business entities that want to maximize returns on their investment.

What this means that the Federal Government couldn't be promoting investment in the coal sector either as a strategic mineral for export or for national energy production purposes since the condition it has provided for investments in coal is that it must be done in an environmentally safe and friendly way. However, over the nation's realities in the last 8 years has been of consistent environmental pollution, degradation and violations of human rights of most mining host communities by coal mining companies. The reality also is that the current environmental governance system - regulatory and institutional in Nigeria is not supportive and incapable of enforcing environmental friendly mining.

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[17] Nigeria's First Nationally Determined Contribution - 2021 Update: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Nigeria%20First/NIGERIA%202021%20NDC-FINAL.pdf

[18] Nigeria Energy MasterPlan 2014: https://rise.esmap.org/data/files/library/nigeria/Clean%20Cooking/Supporting%20Documentation/Nigeria_National%20Energy%20Master%20Plan%20Draft.pdf

Another contradiction and irony is that gas is being promoted by the government as Nigeria's transition energy resource with several GHG emissions mitigation actions planned and being implemented which will reduce Nigeria's emissions not only in the oil and gas sector, but in the energy, transport, industry and residential sectors, yet coal is designated as a strategic mineral. If coal mining and consumption is pursued in line with current government policies, GHG emissions from coal will surpass all the GHG emissions that Nigeria's NDC has committed to reduce by both 20% unconditional and 47% conditional emissions reductions targets.

Therefore, government needs to state clearly what Nigeria's future with coal is, in line with Nigeria's policy on climate change, sustainable development plans, nationally determined contributions, mitigation priorities. Instead of the current policies that encourage coal energy generation, focus should be increased in driving in more investments in the development of more sustainable, low carbon, and renewable energy resources and technologies such biomass/biofuel, wind, waste to energy, solar and including gas as a transition energy resource.

Nigeria also needs to develop a long-term view of its energy infrastructure and its industrial needs. Considering that the country's population is expected to exponentially increase to 397 million persons – approximately the same population size with the United States - by 2050, it is clear that it needs more than a knee-jerk energy plan for its population and its industrialization needs. Its energy governance plans must be long term, and consider in- depth a variety of factors, including its proposed sources of energy and their environmental and economic implications- in particular, creating the resilience to combat climate change, the decentralization of its grid, and the challenges of its capacity upgrades.

Chapter 4: Mainstreaming Climate Change in Nigeria's Mining Sector

4.0 Current reality

Ensuring the mainstreaming climate change in the mining sector has been a major topic on the global landscape for over a decade. The 2015 Paris Agreement and United Nations Sustainable Development Goals set in 2015, brought new attention to the mining sector - what is mined, mining processes, technologies and their impacts on the environment, ecosystem, health, wellbeing and livelihoods of local communities that host mining operations. Asides commitments and efforts to keep coal, hydrocarbons and polluting minerals and metals in the ground, there has been an increased campaign for the greening of the mining sector. This ensures that mining sector builds climate mitigation capabilities, reduces its environmental and carbon footprint, builds resilience and that local communities that are affected by the impact of mining and climate build adequate climate adaptation and resilient capabilities for today and the future. These requirements and shifts are very important for balance as mining continues to be an essential part of the fight against climate change and achieving sustainable development.

In Nigeria, mainstreaming of climate change in the mining sector is fairly new and largely unexplored. A recent study[19] of mainstreaming climate change in the EIAs of projects in the Niger Delta (Rivers, Bayelsa, Delta, Cross River, Edo, Akwa Ibom, Ondo, Abia and Imo state) between 2011 and 2016 revealed that, of all 70 EIA reports reviewed including 2 mining beneficiation and metallurgy EIA reports, none of the reports had climate change adaptation and consultation with the stakeholders including the general public and the host communities. Meanwhile some of the reports had included climate baseline, climate change impacts and mitigation but not adaptation. It is important to note that any project including mining projects that do not provide for consultations with local communities that will be affected by the mining activities and provide a human-centered adaptation plan is problematic, human-unfriendly, unjust, and unsustainable.

Developing a climate adaptation plan for local communities that will be impacted by mining activities will not be possible without first conducting a climate change vulnerability assessment (CCVA). This cardinal stipulation is conspicuously missing in the EIA guidelines and standards, environmental regulations and policies currently being utilized in Nigeria. A climate change vulnerability assessment is meant to identify the vulnerability of species (including humans) to the impacts of climate change, where and when are they vulnerable, and why are they vulnerable; and also consider the social, economic, and environmental systems upon which people depend. Like the community impact assessment advocated for by ELAW, climate change vulnerability assessment seeks to understand the impacts on people and reduce the risks through adaptation measures. This is the foundation of a people-centered, climate smart and sustainable mining that Nigeria needs to pursue.

[19] Mainstreaming Climate Change into the EIA Process in Nigeria: Perspectives from Projects in the Niger Delta Region - https://res.mdpi.com/d_attachment/climate/climate-07-00029/article_deploy/climate-07-00029.pdf

4.1 Climate Smart Mining – Building Blocks

The building blocks of climate-smart mining as advocated by the World Bank are: 1. climate mitigation, 2. climate adaptation, 3. reducing material impacts, 4. creating marketing opportunities - all of which must be conducted under strong governance and adequate regulatory framework and also ensure full gender and multi-stakeholder engagement.

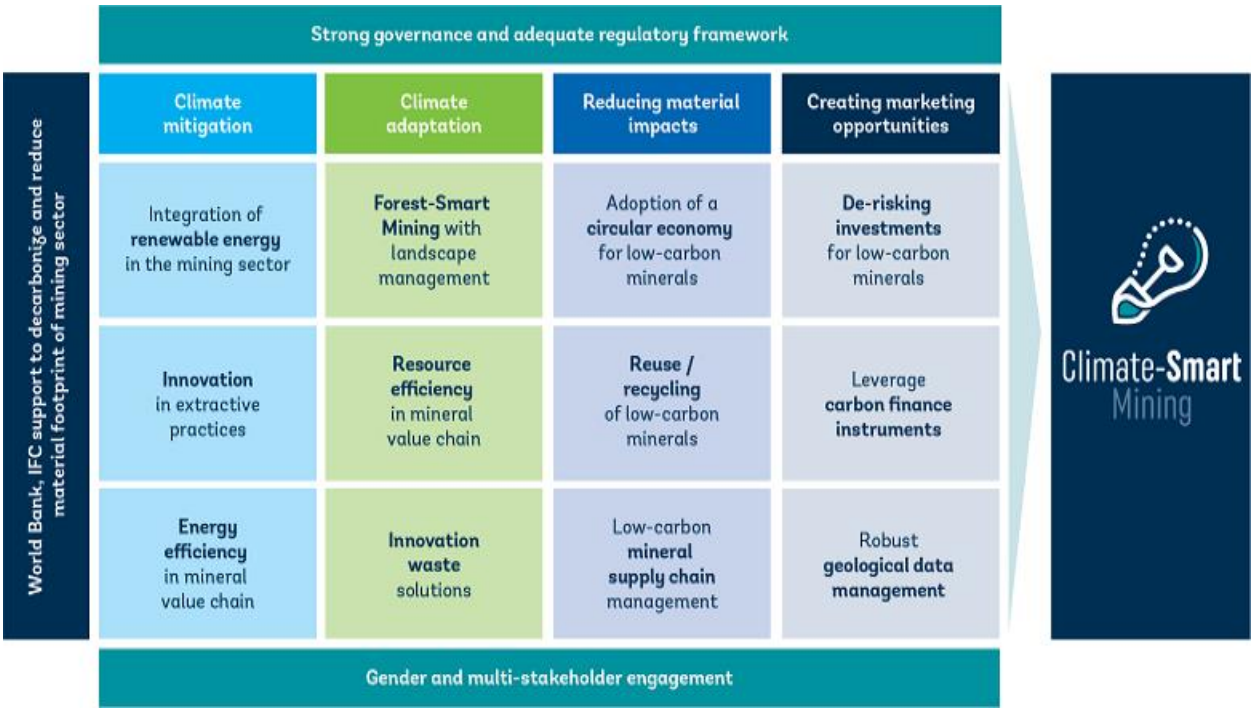
Climate Mitigation : i) Integration of renewable energy in the mining sector; ii) Innovation in extractive practices; and, iii) Energy efficiency in mineral value chain.

Climate Adaptation : i) Forest-Smart Mining with landscape management; ii) Resource efficiency in mineral value chain; and, iii) innovation waste solutions.

Reducing Material Impacts : i) Adoption of a circular economy for low-carbon minerals; ii) Reuse / recycling of low-carbon minerals; and, iii) Low-carbon mineral supply chain management.

Creating Marketing Opportunities : i) De-risking investments for low-carbon minerals; ii) Leveraging carbon finance instruments; and, iii) Robust geological data management.

These building blocks are essential for greening the entire mineral and mining sector value chain – from the energy and water input for mining and processing to the types of technology used, to the types of materials used, management of by-products and waste, management of the environment and ecosystem, creating climate adaptation and resilient livelihoods for the local host communities and many more inputs that lead to sustainable development. Therefore, individual countries are encouraged to build on these building blocks based upon their peculiar contexts. In Nigeria's context therefore, it is essential to embrace these building blocks and decide which others are the most critical for its mining sector, and how best to adapt them to the nation's local realities.



Chapter 5: Recommendations and Conclusion

5.1 Recommendations

Therefore, given all of the foregoing, in order to mainstream climate change in Nigeria's mining sector it is imperative that the Government:

1. Conduct continuous and extensive dialogues and study on the intersection of mining and climate change in Nigeria and its impact on mining host communities, mining companies and other stakeholders.
2. Articulate what Nigeria's unique climate smart mining building blocks should be, in addition to the already provided building blocks and how they should be actualized by the industry.
3. Review Nigeria's energy policy, masterplan and the priority minerals for the minerals sector to delist coal because of the high environmental and carbon footprint that is associated with its mining and combustion.
4. Review its environmental impact assessment guidelines and standards to include rigorous community impact assessment, climate change vulnerability impact assessment with appropriate mitigation and adaptation plans.
5. Develop basic EIA and SIA standards for artisanal mining operations (including sand quarrying) throughout the country.

6. Revise the Minerals and Mining Act 2007 to provide for:

    a. Extensive inclusive, gender and multi-stakeholder engagement process particularly with mining host communities by mining host companies;
    b. Detailed environmental impact assessment to be conducted and satisfactory statement issued before an exploration license or mining lease is issued by the Minister;
    c. Mandatory inclusion of climate adaptation projects in community development agreements (CDA) with mining host communities; and,
    d. Design of Environment Protection and Rehabilitation Program that is climate compliant.
    e. Review the National Climate Change Policy and Response Strategy (NCCPRS) and National Adaptation Strategy and Plan of Action for Climate Change Nigeria (NASPA-CCN) to develop carbon emissions reductions targets for the metals, minerals and mining sector and design appropriate response strategies, mitigation and adaptation plans.

7. Revise the National Environmental Regulations especially those that are applicable to the mining sector to clearly articulate what cleaner, more efficient, climate friendly

technologies, production processes and pollution prevention measures will be permitted for use in the mining sector, in order to secure a climate smart mining pathway for Nigeria.

8. Conduct a comprehensive National Environmental, Economic and Development Study (NEEDS) for Climate Change in Nigeria that is inclusive of the mining sector.
9. Review the National Policy on Environment, forest, water, land use policies to ensure that they are directed towards comprehensive environmental protection from all sectors of the economy including mining sector for the achievement of national development and sustainable development goals.
10. 10. Rework its current energy source policies to be future-thinking. In particular, it should totally exclude coal energy from the nation's energy mix, considering the true negative costs of coal powered energy, and the cost effectiveness and viability of renewable energy options.
11. Increase investment for the development of more sustainable, low carbon, and renewable energy resources and technologies such biomass/biofuel, wind, waste to energy, solar and including gas as a transition energy resource.
12. Provide incentives for industries that are currently reliant on coal power for its industrial activities to switch to gas within a specific timeframe in line with Nigeria's NDC.
13. Discontinue the licensing of new coal mines, coal power plants or industrial processes that utilize coal is energy resource.

5.2 Conclusion

The concept of climate smart mining is a win-win for all stakeholders in the minerals and mining sector as it guarantees continued long term sustainable mutual and peaceful coexistence of all stakeholders particularly mining companies and local mining host communities.

Achieving climate smart mining for Nigeria has to be an all-stakeholders effort and must start with the recognition that mining host communities are people who have rights, and that their dignity should be respected and upheld. This will mainstream the consciousness for developing mining and environment frameworks that are people centered which the inclusion of community impact assessment and climate change vulnerability assessments will help achieve. These will contribute to building climate resilient, mitigation and adaptation capabilities that will in turn lead to sustainable development in the nation's agriculture and land use, water, and fisheries sector.

Nigeria's civil society, host communities and the media have a duty to continue hold the government and mining companies to the highest standards of accountability and equitable governance in ensuring a climate smart future for the country. Importantly, there is need for increased, extensive and inclusive sector platforms for dialogue on the pathway that Nigeria intends for its mineral and mining sector. In all, our objectives must lead to pathways that guarantee sustainable development for all.

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